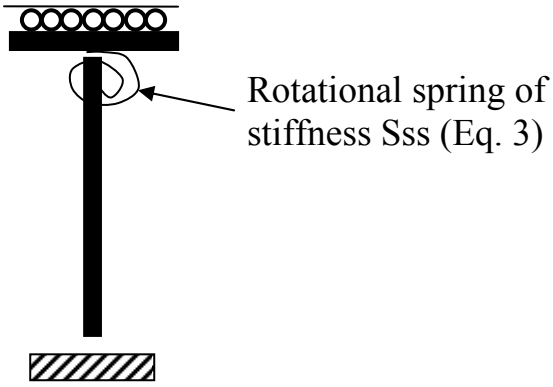

Figure 3. Model analyzed to obtain data shown in Figure 1

Objectives

The research work presented in the report addresses the potential areas of conservatism in the current practice related to bridge bents supported by drilled shafts and piles. An improved set of design guidelines and recommendations regarding super-sub structure rotational stiffness, shaft/pile top boundary conditions, and resistance factors are proposed along with characterizing the impact of the current practice and various design assumptions on sizing components of bridge bents. The research encompasses modeling efforts and an experimental program. Modeling includes analysis of existing bridge case studies with drilled shaft foundations to characterize the impact of the current assumptions on sizing the various components of the bridge bent. An experimental program is performed to evaluate the connection stiffness, and to determine if a given connection has sufficient moment capacity to develop such stiffness. The experimental program includes testing bearing pads in compression and shear to define their index properties. The bearing pads are then tested in a prototype bridge set up to measure their performance under simulated loading. Serviceability limit states are also presented and discussed.

Resistance factors are developed for drilled shafts, based on load test data from the state's geologic regions, for compatibility with LRFD implementation. Work in the report serves to provide a better understanding of the performance of bents supported by drilled shafts under AASHTO loading conditions. Such understanding serves as a tool that